

What is claimed is:

1 1. A method of network address port translation
2 and fast look-up, implemented in a gateway connecting
3 a virtual network and an external network, wherein the
4 virtual network comprises at least a server, and the
5 external network comprises at least a host, comprising
6 the steps of:
7 creating a translation table including a
8 plurality of translation data each provided
9 with an index and comprising host address
10 and port information, server address and
11 port information, and gateway address and
12 port information, the server address and
13 port information comprising server internet
14 protocol(IP) address and port information;
15 receiving, from the host, a first data packet
16 comprising first source address and port
17 information and first destination address
18 and port information, wherein the first
19 source address and port information comprise
20 first source IP address and first source
21 port information;
22 searching corresponding translation data of the
23 first data packet in the translation table;
24 translating the first source IP address or port
25 information into a factor related to the
26 index of the translation data and the first
27 destination address and port information
28 into the server address and port information

29 of the corresponding translation data when
30 the corresponding translation data of the
31 first data packet is located; and
32 transporting the first data packet to a
33 corresponding server according to the server
34 IP address therein.

1 2. The method as claimed in claim 1, further
2 comprising the steps of:
3 receiving a second data packet comprising second
4 source address and port information and
5 second destination address and port
6 information, wherein the second destination
7 address and port information comprises
8 second destination IP address and second
9 destination port information, the second
10 destination IP address or second destination
11 port information is a second factor related
12 to a second index;
13 acquiring the related second index according to
14 the second factor and retrieving
15 corresponding translation data of the second
16 data packet from the translation table
17 according to the second index directly;
18 translating the second source address and port
19 information into gateway address and port
20 information of the translation data and the
21 second destination IP address or port
22 information into host IP address or port
23 information of the translation data; and

24 transporting the second data packet to a
25 corresponding host according to the IP
26 address of the corresponding host.

1 3. The method as claimed in claim 1, further
2 comprising maintaining a mapping table in the gateway,
3 storing a plurality of mapping data each comprising
4 server address and port information and gateway
5 address and port information.

1 4. The method as claimed in claim 3, further
2 comprising the steps of:

3 searching related mapping data in the mapping
4 table according to the first destination
5 address and port information when
6 corresponding translation data of the first
7 data packet is not located in the
8 translation table;

9 adding new translation data assigned with a third
10 index in the translation table, which
11 comprises the searched mapping data and the
12 first source address and port information;

13 translating the first source IP address or port
14 information into a factor related to the
15 third index and first destination address
16 and port information into server address and
17 port information of the searched mapping
18 data; and

19 transporting the first data packet to a
20 corresponding server according to the IP
21 address of the corresponding server.

1 5. A method of network address port translation
2 and fast look-up, implemented in a gateway connecting
3 a virtual internal network and an external network and
4 comprising a mapping table, wherein the virtual
5 internal network comprises at least a server, the
6 external network comprises at least a host, and the
7 mapping table stores private internet protocol(IP)
8 address and private port information of each server,
9 gateway IP address, and gateway port information,
10 comprising the steps of:

11 creating a translation table comprising a
12 plurality of translation data each provided
13 with an index and containing host IP
14 address, host port information, server
15 private IP address, server private port
16 information, gateway IP address, and gateway
17 port information;

18 receiving, from the host, a first data packet
19 comprising source IP address, source port
20 information, destination IP address, and
21 destination port information, wherein the
22 source IP address and the source port
23 information comprise an IP address and a
24 port number of the host transporting the
25 first data packet, and the destination IP
26 address and the destination port information
27 comprise an IP address and a port number of
28 the gateway;

29 searching corresponding translation data of the
30 first data packet in the translation table;
31 translating the source IP address or source port
32 information into a factor related to the
33 index of the translation data and the
34 destination IP address and destination port
35 information into the server private IP
36 address and server private port information
37 of the server when the corresponding
38 translation data of the first data packet is
39 located; and
40 transporting the first data packet to a
41 corresponding server according to the
42 translated destination IP address
43 information therein.

1 6. The method as claimed in claim 5, further
2 comprising the steps of:
3 receiving, from a server, a second data packet
4 comprising a source IP address and source
5 port information and a destination IP
6 address and destination port information,
7 wherein the source IP address and source
8 port information comprise server private IP
9 address and port information, the
10 destination IP address comprises a host IP
11 address, and the destination address or
12 destination port information is a second
13 factor related to a second index;

14 acquiring the related second index according to
15 the second factor and retrieving
16 corresponding translation data of the second
17 data packet from the translation table
18 according to the second index directly;
19 translating the destination IP address or
20 destination port information into the host
21 IP address or host port information of the
22 host transporting the first data packet and
23 the source IP address and source port
24 information of the second data packet into a
25 IP address and port information of the
26 gateway; and
27 transporting the second data packet to the host
28 according to the destination IP address.

1 7. The method as claimed in claim 5, further
2 comprising the steps of:
3 searching a corresponding server private IP
4 address and port information in the mapping
5 table according to the destination IP
6 address and port information when the
7 corresponding translation data of the first
8 data packet is not located in the
9 translation table;
10 adding new translation data assigned with an
11 index in the translation table, which
12 comprises the searched private IP address,
13 the searched port information, the source IP
14 address, the source port information, the

15 destination IP address, and the destination
16 port information;
17 translating the source IP address or the source
18 port information into a factor related to
19 the corresponding index and the destination
20 IP address and the destination port
21 information into corresponding server
22 private address and server port information
23 of the searched mapping data; and
24 transporting the first data packet to a
25 corresponding server according to the new
26 destination IP address and destination port
27 information.

1 8. A network address port translation (NAPT)
2 gateway connecting a virtual network and an external
3 network, comprising:
4 a translation table comprising a plurality of
5 translation data each provided with an index
6 and comprising host address and port
7 information, server address and port
8 information, and gateway address and port
9 information, wherein the server address and
10 port information comprising server internet
11 protocol(IP) address information and port
12 information;
13 a receiving unit receiving, from the host, a
14 first data packet comprising first source
15 address and port information and first
16 destination address and port information,

17 wherein the first source address and port
18 information comprises first source IP
19 address and first source port information;
20 a processing unit searching corresponding
21 translation data of the first data packet in
22 the translation table and translating the
23 first source IP address or first source port
24 information into a factor related to the
25 index of the translation data and the first
26 destination address and port information
27 into the server address and port information
28 of the corresponding translation data when
29 the corresponding translation data of the
30 first data packet is found; and
31 a transporting unit coupling with the processing
32 unit and transporting the first data packet
33 to a corresponding server according to the
34 server IP address therein.

1 9. The gateway as claimed in claim 8, wherein
2 the receiving unit receives, from a server, a second
3 data packet comprising second source address and port
4 information and second destination address and port
5 information, wherein the second destination address
6 and port information comprises second destination IP
7 address and port information, and the second
8 destination IP address or destination port information
9 is a second factor related to a second index;

1 10. The gateway as claimed in claim 9, wherein
2 the processing unit acquires the related second index

3 according to the second factor and retrieves
4 corresponding translation data of the second data
5 packet from the translation table according to the
6 second index directly and translating the second
7 source address and port information into gateway
8 address and port information of the translation data
9 and the second destination IP address or destination
10 port information into host IP address or port
11 information of the translation data.

1 11. The gateway as claimed in claim 10, wherein
2 the transporting unit transports the second data
3 packet to a corresponding host according to the IP
4 address thereof.

1 12. The gateway as claimed in claim 8, wherein
2 the host address and port information comprises a host
3 IP address and host port information, and the gateway
4 address and port information comprises a gateway IP
5 address and gateway port information.

6 13. The gateway as claimed in claim 8, further
7 comprising:

8 a mapping table storing a plurality of mapping
9 data each comprising server address and port
10 information and gateway address and port
11 information;

12 wherein the processing unit searches related
13 mapping data according to the first
14 destination address and port information,
15 adding third translation data provided with

16 a third index in the translation table,
17 which comprises the searched mapping data
18 and the first source address and port
19 information, and translating the first
20 source IP address or first source port
21 information into a factor related to the
22 third index when the corresponding
23 translation data of the first data packet is
24 not located.

1 14. The gateway as claimed in claim 13, wherein
2 the server address and port information comprises a
3 server IP address and server port information, and the
4 gateway address and port information comprises a
5 gateway IP address and gateway port information.